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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/825,756	04/16/2004	Sara Oueslati	33901-147	8513

7590 08/14/2007
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EXAMINER

SEFCHECK, GREGORY B

ART UNIT	PAPER NUMBER
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2616

MAIL DATE	DELIVERY MODE
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08/14/2007

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/825,756

Applicant(s)

OUESLATI ET AL.

Examiner

Gregory B. Sefcheck

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 16 April 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-37 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-7, 9-25 and 27-37 is/are rejected.
- 7) ☒ Claim(s) 8 and 26 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 16 April 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

- Priority to Application 0305069 filed in France on 4/24/2003 is acknowledged.
- US application 10/687,827 to Hui is relied upon in the rejections of claims 10-16 and 28-34, below. Hui qualifies as prior art with benefit of provisional application 60/419,572, filed 10/21/2002. The pre-grant publication (US 20040151197A1) of Hui incorrectly identifies provisional application 60/419,527. The correct provisional application ('572) has been included on the accompanying PTO-892.

Specification

1. The abstract of the disclosure is objected to because of the use of legal phraseology (means) on line 3. Correction is required. See MPEP § 608.01(b).

Applicant is reminded of the proper language and format for an abstract of the disclosure.

The abstract should be in narrative form and generally limited to a single paragraph on a separate sheet within the range of 50 to 150 words. It is important that the abstract not exceed 150 words in length since the space provided for the abstract on the computer tape used by the printer is limited. The form and legal phraseology often used in patent claims, such as "means" and "said," should be avoided. The abstract should describe the disclosure sufficiently to assist readers in deciding whether there is a need for consulting the full patent text for details.

The language should be clear and concise and should not repeat information given in the title. It should avoid using phrases which can be implied, such as, "The disclosure concerns," "The disclosure defined by this invention," "The disclosure describes," etc.

Claim Objections

2. Claims 12, 16, 21, 32, and 34 are objected to because of the following informalities (appropriate correction is required):

Claim 12 is objected to because of the following informalities: Claims include "adapted to" language which suggests or makes optional but does not require the claimed operations to be performed. Subsequently, the claims raise a question as to the limiting effect of the language. Please see MPEP 2111.04.

Claim 16 and 34: "or not" should be deleted from the end of each claim.

Claim 21 recites "the means for controlling admission of the data". There is insufficient antecedent basis for this limitation in the claim. This limitation will be interpreted according to the corresponding structure of device claim 3.

Claim 32: "congestion measurement" should be amended into the form of a further method step to be performed.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claim 14 and 37 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Regarding claim 14, the word "means" is preceded by the word(s) "congestion measuring" in an attempt to use a "means" clause to recite a claim element as a means for performing a specified function. However, since no function is specified by the word(s) preceding "means," it is impossible to determine the equivalents of the element,

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as required by 35 U.S.C. 112, sixth paragraph. See *Ex parte Klumb*, 159 USPQ 694 (Bd. App. 1967).

Claim 37 recites the limitation "the free portion of the flow identifier". There is insufficient antecedent basis for both "flow identifier" and "free portion" in the claim, rendering the claim indefinite as to the use of a free portion of a flow identifier in the function of address attributes, as claimed.

Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

6. Claims 1-7, 9, 17-25, 27, 36, and 37 are rejected under 35 U.S.C. 102(e) as being anticipated by Roberts (US007126918B2).

- Regarding Claims 1 and 19,

Roberts discloses methods and devices for micro-flow management at switches in a communication network (Title; Fig. 2; meets claim 1,19 – device/method for processing packets of flows on a network link).

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Roberts discloses each switch 2020 within network 200 schedules packets across the switch core by relying upon a weighted (priority) fair queuing technique to adjust the transmission rate of packets of each microflow in order to maintain fairness among the various flows while meeting quality-of-service (QoS) parameters of the micro-flow contained and extracted from the packet header (Fig. 3A-5; Col. 10, lines 54-57; claim 1,19 – scheduling means/step for scheduling packets in a queue as a function of a priority based on analyzing the incoming bit rate of the flows relative to a fair bit rate and in accordance with a fair queuing with priority algorithm).

- Regarding Claims 2, 3, 20 and 21,

Roberts discloses methods and devices for micro-flow management at switches in a communication network that meets all limitations of the parent claims.

Referring to Fig. 5, Roberts discloses packets are received at the network trunk line interface according to various layered protocols (Col. 12, lines 35-48; meets claim 2,20 – admission control means/step for controlling admission of packets into device in accordance with admission criteria).

Roberts also shows received packets processed for admission to the switch based upon information input from policing scheduler 540 and policy table 580 (Fig. 5, 7; Col. 13-14, lines 12-53; claim 3,21 – scheduling means/step for sending admissibility condition data to the admission control means).

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- Regarding Claims 4 and 22,

Roberts discloses methods and devices for micro-flow management at switches in a communication network that meets all limitations of the parent claims.

Roberts further discloses micro-flow recognizer 520 searches (interrogates) the flow block table 570 to determine if the flow block exists (Col. 12, lines 49-67; meets claim 4,22 – admission means comprise means for interrogating a list of protected flows for each incoming packet).

- Regarding Claims 5 and 23,

Roberts discloses methods and devices for micro-flow management at switches in a communication network that meets all limitations of the parent claims.

Roberts discloses a micro-flow timeout period in which a micro-flow is terminated if another packet belonging to the flow is not received after a certain period of time (Col. 9, lines 63-65; meets claim 5,23 – means/step for erasing flows for which the time elapsed since the last packet was received exceeds a threshold value from the list of flows).

- Regarding Claims 6, 7, 9, 17, 24, 25, 27, and 36,

Roberts discloses methods and devices for micro-flow management at switches in a communication network that meets all limitations of the parent claims.

Roberts discloses determining whether a flow block already exists for a received packet by searching the flow block table 570. Packets not belonging to an existing flow

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in flow block table 570 are scheduled by constructing a new flow block in table 570 with corresponding QoS values (defining the QoS class) of the flow extracted (discriminated) from the received packet, thereby defining how subsequently received packets of the same flow are processed (Fig. 6; Col. 3-4, lines 60-8; Col. 13-14, lines 12-13; meets claim 6,24 – admission means comprise means for determining if the admission criteria are satisfied if a packet belongs to a flow that is not in the list of protected flows; claim 7,25 – means for entering a new flow in the list if the admission criteria are satisfied; claim 17,36 – discrimination means for distinguishing classes of service at admission control level; claim 9,27 – scheduling means schedule as priority packet any packets of flows in the queue that are not in a list of active flows; claim 9,27 – schedule as non-priority packets any packets of flows that are in the list).

- Regarding Claim 18 and 37 (as best understood),

Roberts discloses methods and devices for micro-flow management at switches in a communication network that meets all limitations of the parent claims.

Roberts discloses fairness scheduling (load sharing) of multiple flows over multiple links of network 200 (Fig. 2) based upon identification of a flow. Roberts discloses the flow identification is achieved by generating a hash key with the network layer and transport layer information of a flow's packet (address attributes; Col. 12, lines 54-57; meets claim 18 – flows are identified by a hashing function applied to address attributes; claim 37 – load sharing of flows over a plurality of links is effected with the aid of a function of address attributes including the free portion of the flow identifier).

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claims 10-14, 16, 28-32, and 34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Roberts in view of Hui (US 20040151197A1).

- Regarding Claims 10, 16, 28, and 34,

Roberts discloses methods and devices for micro-flow management at switches in a communication network that meets all limitations of the parent claims.

Roberts does not explicitly disclose scheduling packets in a PIFO queue or determining the presence of packets in the queue.

Hui discloses per-flow queuing in a shared memory switch architecture in which the priority of packets is represented by queuing elements having a priority level determined by a weighted fair queue algorithm (Abstract). Hui discloses calculating (scheduling) a departure time through packet buffer 730 for each new packet received for each flow, under control of multi-FIFO controller 725, based upon the value of time stamps (Pg. 1, paragraph 8; Pg. 3, paragraph 41; Pg. 6, paragraph 70-71; meets claim 10,28 – schedule packets in a PIFO queue). Hui discloses rowmin and global min logic of the switch identifies the packets and their corresponding priority stored in the switch,

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therefore also operable to identify when there are no packets in the switch (Pg. 2, paragraph 16; claim 16,34 – means for determining whether the PIFO queue is empty).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify Roberts by scheduling packets through management of a PIFO queue, as shown by Hui, thereby ensuring that the highest priority packet of a respective flow is transmitted when the flow's corresponding port is granted access to the transmission medium.

- Regarding Claims 11 and 29,

Roberts discloses methods and devices for micro-flow management at switches in a communication network that meets all limitations of the parent claims.

Roberts does not explicitly disclose maintaining a pointer to identify the last of the priority packets at the head of the queue.

Hui discloses queuing elements in which the priority value of the last packet of each flow is maintained for determining the priority of the new packet (Fig. 4, step 405; Fig. 7, VCold; Pg. 4, paragraph 44; meets claim 11,29 – pointer P identifies the last of the priority packets at the head of the queue).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify Roberts by utilizing the last of the priority packets in the queue for determining the priority of the newly received packet, as shown by Hui, thereby maintaining fairness in assigning priority to packets from various flows.

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- Regarding Claims 12 and 30,

Roberts discloses methods and devices for micro-flow management at switches in a communication network that meets all limitations of the parent claims.

Roberts discloses employing flow block table 570 to determine existing (active) flows into the switch (Col. 12, lines 64-67; meets claim 12,30 – employ a list of active flows containing identifiers of the active flows).

Roberts does not explicitly disclose the use of a time stamp for scheduling packets.

Hui discloses per-flow queuing in a shared memory switch architecture in which the priority of packets is represented by queuing elements having a priority level determined by a weighted fair queue algorithm (Abstract). Hui discloses calculating (scheduling) a departure time for each new packet received for each flow, under control of multi-FIFO controller 725, based upon the value of time stamps (Pg. 1, paragraph 8; Pg. 3, paragraph 41; Pg. 6, paragraph 70-71; meets claim 12,30 - time stamp is used for scheduling packets)

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify Roberts by scheduling packets using a time stamp, as shown by Hui. This would ensure that the time constraints related to the QoS of packets are adhered to in scheduling data through the switch.

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- Regarding Claims 13 and 31,

Roberts discloses methods and devices for micro-flow management at switches in a communication network that meets all limitations of the parent claims.

Roberts discloses that flows are established (written) and terminated (erased) in the flow block table 570 as packets of those flows are communicated through the switch (Col. 8, lines 28-32; meets claim 13,31 – means for writing flows in and erasing flows from the list of active flows as a function of the arrival and departure of packets of the flows).

- Regarding Claims 14 and 32 (as best understood),

Roberts discloses methods and devices for micro-flow management at switches in a communication network that meets all limitations of the parent claims.

Referring to Fig. 9, Roberts discloses the ability to measure the traffic of the network to determine when to discard packets to avoid congestion as the rate of respective flows are adjusted (Col. 16, lines 48-67; meets claim 14,32 – congestion measuring means).

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9. Claims 15 and 33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Roberts in view of Hui as applied to claims 14 and 32 above, and further in view of Myr (US 20030014180A1).

- Regarding Claims 15 and 33,

Roberts discloses methods and devices for micro-flow management at switches in a communication network that meets all limitations of the parent claims.

Roberts does not explicitly disclose congestion measurements carried out as a function of a local time, a number of priority packet bytes transmitted during a current measurement period, and a number of bytes that a dummy flow could send in said current measuring period.

Myr discloses managing congestion using system-wide signal timing, in which congestion is measured based upon actual travel times over a fixed control time period compared to the theoretical times over that same period, thereby forming a basis of an optimization model for improving congestion at subsequent intervals (Abstract; meets claim 15,33 – congestion measurements are carried out as a function of a local time, a number of priority packet bytes transmitted during a current measurement period, and a number of bytes that a dummy flow could send in said current measuring period).

Though the disclosure of Myr pertains to vehicular congestion through a given road network rather than communication network traffic congestion, Myr is analogous to Roberts and Hui for the general purposes of measuring and improving congestion.

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It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the Roberts by making congestion measurements as a function of actual packet transmissions and theoretical transmissions over a timing-controlled measurement period, as shown by Myr. The theoretical times provide a reference point that would enable Roberts to determine if congestion occurs for a particular flow during a measured interval.

10. Claim 35 is rejected under 35 U.S.C. 103(a) as being unpatentable over Roberts in view of Shimojo et al. (US006643256B1), hereafter Shimojo.

- Regarding Claim 35,

Roberts discloses methods and devices for micro-flow management at switches in a communication network that meets all limitations of the parent claims.

Roberts discloses the use of discarding of packets of a particular flow as a way of achieving efficient QoS for users (Col. 3, lines 20-25). However, Roberts does not explicitly disclose sending a signal to a user relating to the loss of packets.

Shimojo discloses a packet switch using priority control based on congestion status within the switch (Title). Shimojo discloses notifying the user of packet loss due to congestion as a way of adjusting the rate to alleviate the congestion (Col. 1, lines 62-67; Col. 17, lines 35-64; meets claim 35 – signal relating to the loss of packets is sent to a user).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify Roberts by notifying the user of discarded packets, as shown by Shimojo. This would enable the user to attempt retransmission of the packet while controlling congestion and maintaining QoS in the network.

Allowable Subject Matter

11. Claims 8 and 26 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

- Regarding Claims 8 and 26,

The prior art of record discloses various implementations of admission control for multiple data flows within a communication network based upon fair bit rate, priority, and load of the flows based upon packet lengths. However, the prior art does not teach or fairly suggest admission control data that specifically includes a priority load value, which is the sum of the lengths of priority packets transmitted in a certain time period divided by the duration of that time period, in combination with a fair bit rate value representing the bit rate achieved by a data flow that always has packets to send.

Conclusion

12. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.


- Balakrishnan et al. (US 20040196790A1)
- Stiliadis (US 20040008716A1)
- Knight et al. (US 20020150047A1)
- Mekittikul et al. (US007061861B1)
- Prieto, Jr. et al. (US007002918B1)
- Jain et al. (US005633859A)

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Gregory B. Sefcheck whose telephone number is 571-272-3098. The examiner can normally be reached on Monday-Friday, 8:00am-4:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wing Chan can be reached on 571-272-7493. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



Gregory Sefcheck
Patent Examiner
8-10-2007